



Research Strategy

Mission Statement

- Restore promotes and provides research into the treatment of burns and life-changing wounds with particular emphasis on scarring.
- Our objective is to lessen the burden, physically and psychologically, of abnormal scarring on the individual and society as a whole.

Our Challenges & the Benefits

- Our research is rooted in the everyday challenges faced by medical and nursing staff working with patients in Burns and Plastic Surgery Units. The patient is at the heart of our focus.
- Our philosophy is to identify the key factors causing poor wound healing using clinically relevant models, investigate these in the laboratory using cutting-edge techniques, and then to improve patient outcomes through the findings. We are seeking improvement in the debility of burns and similar wounds.
- Allied themes include interventions at any point on the patient pathway, from prevention to psychological support after injury, which may improve outcome.
- The benefits of our research will include the reduction of the physical and emotional burden of scarring to the patient.
- We aim to achieve a national, collaborative approach as indicated by our track record of projects with a range of burns services and academic institutions.
- We target the widest possible target audience for our findings as indicated by the diversity of our publications and presentations, both nationally and internationally.
- The themes of our work sit harmoniously with current governmental initiatives in fibrotic diseases, preventative public health, stem cell research, genomics and proteomics, and the use of human models of disease.
- We aim to nurture the development of research skills in our staff and facilitate their lifelong interest in the prevention and treatment of burn injuries.

Why are we funding research?

Scarring within the skin is a frequent outcome after burn injury. It can be devastating for those affected. As well as the physical symptoms it can produce – pain, itching, recurrent infections and limitation of movement – the unsightly appearance can stigmatise and marginalise an individual from society. Scarring can trigger low self-esteem and even psychological illness.

Millions of people have significant scars from all causes. The financial cost of treating these and the wounds that trigger them runs into hundreds of millions of pounds. Such scars can be medically improved but never eradicated: currently there is no drug that can eliminate scarring. More globally, the lessons learnt at a molecular level in the skin may be useful in the treatment of other significant conditions in which *fibrosis* is a key feature such as Alzheimer's disease, myocardial infarction, liver cirrhosis and lung fibrosis. By funding research into fundamental questions such as the molecular causes of scarring and their psychological outcome, we are in a unique position within the United Kingdom.

Our Key Research Areas

Our current focus is in three key areas:

- *“The molecular effect of cooling on human burns.”*
Cooling an acute burn injury appears to reduce pain and inflammation. Ongoing inflammation has been shown to increase the likelihood of a burn going on to produce excessive scarring. In a completely novel human burn model, we are investigating using a global, genomic approach which molecules seem to be protective in cooled skin. Our theory is that these molecules may reduce inflammation and scarring if ultimately applied to the acute burn.
- *“Resurfacing after burn injury by harnessing the immune system.”*
Extensive burns can be life-threatening. Non-viable skin must be removed before it triggers severe, harmful inflammation. It has to be replaced with healthy skin. Sometimes the patient does not have enough reserves of skin to permit rapid resurfacing. This can lead to a risk of overwhelming infection. Cadaveric skin can be used to resurface the burn. However, ultimately this skin is rejected by the immune system which does not accept cells from an unrelated individual. The aim of this project is to establish whether cadaveric skin can be used to resurface large burns if the immune system is manipulated effectively. This would be a major advance for such patients.
- *“Establishing an effective assessment tool for burns patients.”*
What is perceived as a good outcome from a burn injury by a surgeon may be viewed very differently by a patient. There is no standardized tool for assessing how the patient perceives their outcome and recovery. It is important that we understand how treatments affect patients psychologically so that we can assess which ones are beneficial. This project aims to establish for the first time in the United Kingdom a standardized scoring system after burns that reflects the domains that are relevant to patients, for example, body image and disfigurement.

What themes unify our research?

- Whenever possible, we aim to investigate wounds and scarring in human models as this has immediate relevance to real world problems. However, as a member of the Association of Medical Research Charities (AMRC), we support the AMRC position statement on the use of animals in research.

- We link up leading clinical teams with their counterparts in the laboratory, both using cutting-edge techniques. This means we are not constrained in our search for the best solution to the identified problem.
- We look globally at the relevant issues. For example, we utilise molecular screening approaches that analyse many thousands of potential targets simultaneously.
- Our ethos leads to relatively rapid solutions that can rapidly translate into improvements in patient care.

Our Grants

- Restore award “*Duke of Kent Plastic Surgery Research Fellowships.*” Typically there are two to three fellows at any one time.
- Fellows must be medical doctors, surgeons, medical students or allied discipline staff with permission to work and reside in the UK.
- We advertise the fellowships in The British Medical Journal and NHS Jobs (<https://www.jobs.nhs.uk/>). The application process consists of a review of the candidates’ *curriculum vitae* and past achievements. This is followed by an interview conducted by the Internal Review Panel and officers of Restore. Applicants will receive oral feedback after the assessment process is completed.
- There are no restrictions as to where work is carried out, but the Fellow is expected to conduct the majority of any clinical studies at Stoke Mandeville Hospital in Aylesbury, Buckinghamshire. However, laboratory studies can be carried out any convenient location dependent upon the availability of the scientific techniques used to address the question at hand. In the past, we have forged links with the Universities of Oxford, London and Manchester.
- The research projects to be undertaken by fellows are proposed by our Directors of Research and scrutinised by our peer review process. Our peer review process consists of both an internal and an external peer review panel. The former is composed of those members of our Scientific Advisory Committee with no direct or indirect links to the proposed research project. We benefit from a wide range of external reviewers from the domains of clinical medicine, biomedical science and psychology.
- There are two types of award:
 - Traditionally, we have offered posts of two or three years commencing on the award of the fellowship and dependent upon whether the researcher submits for the award of a DM/MD degree or a longer PhD/DPhil. We have established informal links with Green Templeton College at Oxford University to enable future fellows to benefit from integration as Green Templeton Fellows into this supportive centre of academic excellence. Fellows are expected to complete their higher degree and disseminate their findings at national meetings and by the publication of papers within peer-reviewed journals. Overlap of tenure is encouraged between Fellows to facilitate the transfer of knowledge and skills.
 - Single awards for the duration of a year towards a given *project* in the expectation that provisional data will be assimilated that will then permit the project to attract alternative funding sources at the end of the year. Such ‘pump priming’ grants are likely to be limited to a sum of £10,000 at the discretion of the trustees.

- For full degree projects, salary is paid on a monthly basis and Restore will pay for reasonable capital costs, consumables, higher degree entry and publication costs in relation to ongoing projects. Recent grants have ranged from £30,000-160,000 and are committed on the basis of full funding for the particular research project.
- To supplement traditional laboratory meetings, there are regular clinical meetings at which fellows discuss progress with senior members of the SAC or the Clinical Director. Fellows are obliged to present progress reports to our Scientific Advisory Committee at least twice a year. These reports will be assessed by the Committee, our Directors of Research and the Director of Clinical Studies.
- Our partners include the Buckinghamshire NHS Trust, The University of Oxford and The University of the West of England. Past partners have included Cancer Research United Kingdom, Smith and Nephew and Oxford Glycosciences Limited. We are keen to develop partnerships with other relevant charities, academic institutions and health care bodies that share our research interests.

Our Timescale

This strategy has been set as of this date and is intended to be reviewed upon completion of each sequential research project and at least every two years.

March 2016